CHICAGO
Electric® Generators

2.5 HP 1,000 WATT OHV GENERATOR

Model 97906

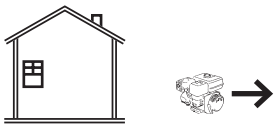
SET UP, OPERATING, AND SERVICING INSTRUCTIONS

⚠ DANGER

Using an engine indoors CAN KILL YOU IN MINUTES.

Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.

NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

Diagrams within this manual may not be drawn proportionally.
Due to continuing improvements, actual product may differ slightly from the product described herein.

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3491 Mission Oaks Blvd., Camarillo, CA 93011
Visit our website at: http://www.harborfreight.com

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

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For technical questions or replacement parts, please call 1-800-444-3353.

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SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER **DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

⚠WARNING **WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

⚠CAUTION **CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **NOTICE is used to address practices not related to personal injury.**

CAUTION **CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.**

WARNING! Read all instructions. Failure to follow all instructions listed below may result in fire, serious injury and/or DEATH. The warnings and precautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

SET UP PRECAUTIONS

1. Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store fuel or other flammable materials nearby.
2. Have multiple ABC class fire extinguishers nearby.
3. Operation of this equipment may create sparks that can start fires around dry vegetation.
   A spark arrestor may be required.
   The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.
4. Set up and use only on a flat, level, well-ventilated surface.

5. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during set up.

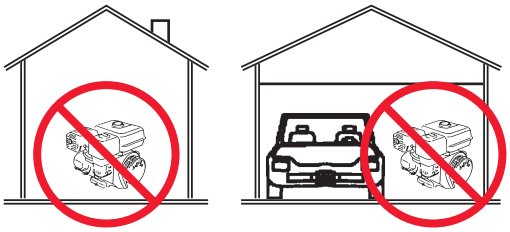
6. Use only oil and fuel recommended in the “Specifications” section of this manual.

OPERATING PRECAUTIONS

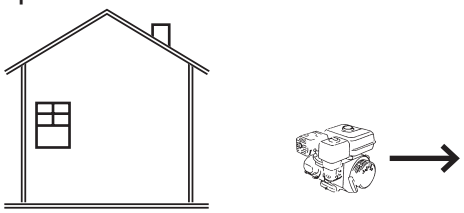
1.

CARBON MONOXIDE HAZARD
Using an engine indoors CAN KILL YOU IN MINUTES.

Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.



NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

2. Keep children away from the equipment, especially while it is operating.

3. Do not leave the equipment unattended when it is running. Turn off the equipment (and remove safety keys, if available) before leaving the work area.

4. Wear ANSI-approved safety goggles and hearing protection during use.

5. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to a heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near the engine’s magneto or recoil starter.

6. Use only accessories that are recommended by Harbor Freight Tools for your model. Accessories that may be suitable for one piece of equipment may become hazardous when used on another piece of equipment.

7. Do not operate in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Gasoline-powered engines may ignite the dust or fumes.

8. Stay alert, watch what you are doing and use common sense when operating this piece of equipment. Do not use this piece of equipment while tired or under the influence of drugs, alcohol or medication.

9. Do not overreach. Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.

10. Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.

11. Parts, especially exhaust system components, get very hot during use. Stay clear of hot parts.

12. Do not cover the engine or equipment during operation.

13. Keep the equipment, engine, and surrounding area clean at all times.

14. Use the equipment, accessories, etc., in accordance with these instructions and in the manner intended for the particular type of equipment, taking into account the working conditions and the work to be performed. Use of the equipment for operations different from those intended could result in a hazardous situation.

15. Do not operate the equipment with known leaks in the engine's fuel system.

16. This product contains or, when used, produces a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. (California Health & Safety Code § 25249.5, *et seq.*)

17. When spills of fuel or oil occur, they must be cleaned up immediately. Dispose of fluids and cleaning materials as per any local, state, or federal codes and regulations. Store oil rags in a bottom-ventilated, covered, metal container.

18. Keep hands and feet away from moving parts. Do not reach over or across equipment during operation.

19. Before use, check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the equipment's operation. **If damaged, have the equipment serviced before using.** Many accidents are caused by poorly maintained equipment.

20. Use the correct equipment for the application. Do not modify the equipment and do not use the equipment for a purpose for which it is not intended.

SERVICE PRECAUTIONS

1. **Before service, maintenance, or cleaning:**
   a. **Turn the engine switch to its "OFF" position.**
   b. **Allow the engine to completely cool.**
   c. **Then, remove the spark plug wire(s) from the spark plug(s).**

2. Keep all safety guards in place and in proper working order. Safety guards include muffler, air cleaner, mechanical guards, and heat shields, among other guards.

3. **Do not alter or adjust any part of the equipment or its engine that is sealed by the manufacturer or distributor. Only a qualified service technician may adjust parts that may increase or decrease governed engine speed.**

4. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during service.

5. Maintain labels and nameplates on the equipment. These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.

6. **This Generator provides unregulated power to the battery charging outlet.** Incorporating an inline regulator is strongly recommended. The charging process must be monitored at all times. The battery charging output must not be used to power any other device or charge any other type

of battery without a proper regulating device.

7. Have the equipment serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the equipment is maintained. Do not attempt any service or maintenance procedures not explained in this manual or any procedures that you are uncertain about your ability to perform safely or correctly.

8. Store equipment out of the reach of children.

9. Follow scheduled engine and equipment maintenance.

10. Refueling Precautions:
    a. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refuelling.
    b. Do not refill the fuel tank while the engine is running or hot.
    c. Do not fill fuel tank to the top. Leave a little room for the fuel to expand as needed.
    d. Refuel in a well-ventilated area only.

GENERATOR PRECAUTIONS

Set up

1. Do not connect generator directly into a home's electrical lines. Do not plug a generator into an outlet in the home. Connecting a generator directly to a utility power supply can 'back feed' along the power lines and kill or injure utility workers working on the lines.

2. All connections from the Generator to a load must be installed by a licensed electrician in compliance with all local, state, and federal electrical codes and standards.

3. The generator must be grounded in accordance with all relevant electrical codes and standards before operation.

4. Insulate all connections and disconnected wires.

5. Connect the generator only to a load or electrical system (120 volt or 240 volt) that is compatible with the electrical characteristics and rated capacities of the generator.

6. Set up the generator outdoors in a well-ventilated, dry area, away from building air intakes. The generator should be protected from direct exposure to rain and snow. Do not set up the generator on a conductive surface such as a metal deck.

7. This generator is not intended to power sensitive electronic equipment without the addition of an appropriate line conditioner

8. Before connecting generator's wiring:
    a. Turn the engine switch to its "OFF" position.
    b. Allow the engine to completely cool.
    c. Then, remove the spark plug Wire(s) from the spark plug(s).

Operation

1. Do not attempt to connect or disconnect load connections while standing in water or on wet ground.

2. Do not touch electrically energized parts of the Generator and interconnecting cables or conductors with any part of the body, or with any non-insulated conductive object.

3. Use only Class BC or Class ABC fire extinguishers on electrical fires.

4. Do not overload the generator. Overloading can cause fires in the electrical cords, in addition to generator and appliance damage.

Service

1. Keep all electrical equipment clean and dry. Replace any wiring where the insulation is damaged. Replace terminals that are worn or corroded. Keep terminals clean and tight.

SAVE THESE INSTRUCTIONS.

BASIC SPECIFICATIONS

Fuel	Type	89+ octane unleaded gasoline
	Capacity	1.05 Gallons
Engine Oil	Type	SAE 10W30 (above 32° F) SAE 5W30 (at 32° F or below)
	Capacity	0.42 Quarts
Horsepower		2.5 HP
Run Time @ 50% Load		4 Hours, 20 Minutes with full tank
Sound Level		65 dB
AC Output		(2) 120 V~, 60 hz 1,000 W Rated 1,050 W Peak
DC Output		16.8V to 17.2V

Note: Additional specifications found in the TECHNICAL ENGINE SPECIFICATIONS chart in this manual.

The emission control system for this engine is warranted for standards set by the U.S. Environmental Protection Agency and by the California Air Resources Board (also known as CARB). For warranty information, refer to the last pages of this manual.

At high altitudes, the engine's carburetor, governor (if so equipped), and any other parts that control the fuel-air ratio will need to be adjusted by a qualified mechanic to allow efficient high-altitude use and to prevent damage to the engine and any other devices used with this product.

UNPACKING

When unpacking, check to make sure that the item is intact and undamaged. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

SET UP INSTRUCTIONS

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

⚠WARNING TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING:

Turn the Power Switch of the equipment to its "OFF" position, wait for the engine to cool, and disconnect the spark plug wire(s) before assembling or making any adjustments to the equipment.

⚠WARNING TO PREVENT SERIOUS INJURY:

Operate only with proper spark arrestor installed.

Operation of this equipment may create sparks that can start fires around dry vegetation.
A spark arrestor may be required.
The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual.

Location

1. The Generator must be installed outdoors where ventilation is readily available.
2. Install the Generator so that the air inlets and outlets are not blocked by obstructions such as bushes, trees, or snow drifts. Locating it in the path of heavy winds or snowdrifts may require the placement of a barrier for protection. The air inlet should face the prevailing wind direction.
3. Install the Generator on a concrete slab or other area where water can not reach it.
4. Generator placement should allow four feet of access on all sides for maintenance.
5. Place the Generator as close as possible to the electrical tools and equipment being powered to reduce the length of extension cords.

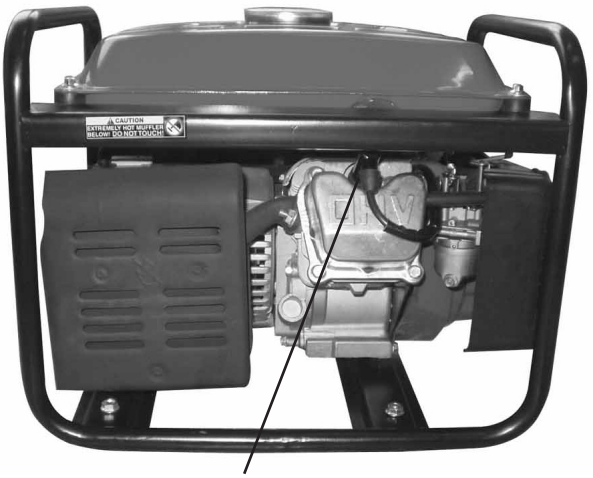
Grounding

1. Connect a #6 AWG grounding wire (not included) from the Grounding Point (55a) on the Generator to a grounding rod (not included) that has been driven at least 24 inches into the ground. The grounding rod must be a copper or brass rod which can adequately ground the Generator. Only a trained and licensed electrician should perform this procedure.
2. Electrical and other permits may be required for the installation of emergency power systems. Investigate local building and electrical codes before installing this unit. Installation must be completed by a licensed contractor.

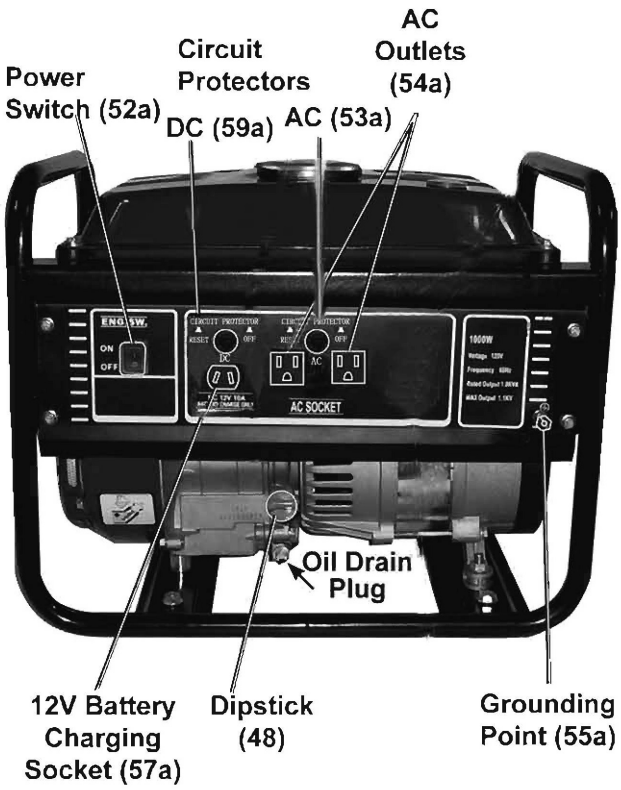
OPERATING INSTRUCTIONS

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Engine Controls



Spark Plug



Starting the Engine

Inspect engine and equipment looking for damaged, loose, and missing parts before set up and starting. If any problems are found, do not use equipment until fixed properly.

Checking and Filling Engine Oil

CAUTION! Your Warranty is VOID if the engine's crankcase is not properly filled with oil before each use. Before each use, check the oil level. Do not run the engine with low or no engine oil. Running the engine with no or low engine oil WILL permanently damage the engine.

1. Remove the dipstick and wipe it off with a clean rag.
2. Reinsert the dipstick completely and remove it to check the oil level. The oil level should be between the high and low marks on the dipstick.
3. If the oil level is below the low mark add the appropriate type of oil until the oil level is between the high and the low marks.

   Oil type:

   32° F or above = SAE 10W30

   Below 32° F = SAE 5W30
4. Replace the Oil Dipstick.

CAUTION! Do not run the engine with too little or too much oil. The engine will be permanently damaged.

Checking and Filling Fuel

1. Check the fuel level on the built-in fuel gauge (if available).

⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Fill the fuel tank in a well-ventilated area away from ignition sources. Do not smoke.

2. To fill the Fuel Tank, first wipe off the Fuel Tank Cap and the surrounding area.
3. Unscrew, and remove the Fuel Tank Cap.
4. Mix fuel stabilizer (not included) with 89 octane (or better) unleaded gasoline according to fuel stabilizer directions.
5. Fill the Fuel Tank to about 1 inch under the neck of the gasoline tank with the stabilized unleaded gasoline mixture.
6. Then replace the Fuel Tank Cap.

Start Procedure

Before starting the engine:

a. **Follow the Set Up Instructions to prepare the equipment.**

b. **Inspect the equipment and engine.**

c. **Fill the engine with the proper amount and type of fuel and oil.**

d. **Read the Equipment Operation section that follows.**

1. Unplug all loads from the Generator before starting to prevent permanent damage to any appliances, tools, or equipment.

2. Turn the engine fuel valve to its "OPEN" position.

3. Turn the engine power switch to its ON or RUN position.

4. Then, turn the engine choke lever to its "CHOKE" position. Set the choke lever in the "RUN" position when starting a warm engine.

5. Grasp the starter handle, and pull slowly until resistance is felt. While holding the handle, allow the starter rope to rewind slowly. Then, pull the starter handle with a rapid, full arm stroke. Once again while holding the handle, allow the rope to rewind slowly. Repeat as necessary, until the engine starts.

6. After the engine starts and warms up, slowly move the choke lever to its "RUN" position.

7. IMPORTANT: Allow the engine to run at no load until warm (1-5 minutes) with no load after each start-up to allow the engine to stabilize.

Break-in Period

1. Breaking-in the engine will help to ensure proper equipment and engine operation, and will extend the engine's lifespan. The warranty is void if the engine is not broken in properly. The first 20 hours of operation is the break-in period.

2. During the first 3 hours of use:
   - Do not apply a heavy load to the equipment.
   - Do not operate the engine at its maximum speed.

3. After the first 20 hours of use:
   - Change the engine oil.

   Under normal operating conditions subsequent maintenance follows the schedule explained in the MAINTENANCE AND SERVICING section.

Equipment Operation

To Power 110/120 Volt AC Tools and Equipment:

1. Prior to powering tools and equipment, make sure the Generator's rated wattage capacity (1000 W) is adequate to supply all electrical loads that the unit will power. If powering exceeds the Generator's capacity, it may be necessary to group one or more of the tools and/or equipment for connection to a separate Generator.

2. Start the Generator with no loads attached. Once the Generator is running, connect the Power Cords of 110/120 volt AC tools and equip-

ment into the 110/120 volt AC Outlets (54a). The Generator has an AC Circuit Protector (53a) to protect the unit in case of an overload. If an overload occurs, the Breaker will switch to its "OFF" position and cause the Generator to shut down. Press the Circuit Protector button (53a) to reset the Generator.

3. When finished using the Generator, turn the Power Switch (52a) to its "OFF" position. Turn the Fuel Valves (9a) to their "OFF" positions. Disconnect all electrical powered tools and equipment from the Generator's AC Outlets.

4. To prevent accidents, turn off the engine and disconnect its spark plug wire after use. Wait for the engine to cool, clean external parts with clean cloth, then store the equipment out of children's reach according to the Storage instructions in this manual.

To Charge 12 V Lead-acid Type Batteries:

⚠WARNING Batteries contain corrosive acid that can cause severe injury; always wear ANSI-approved safety goggles and work gloves when handling.

5. Installing an inline regulator is recommended before charging.

6. Lead-acid batteries are hazardous. Follow all instructions, safety precautions, and charging procedures included with the battery.

7. Start the Generator with no loads attached. Connect the clamps on the Battery Charging Cord (1a) to the battery to be charged first; red clamp to positive terminal (+), and black clamp to negative terminal (-), then plug the Battery Charging Cord into the Battery Charging Socket (57a).

8. Do not leave a battery unattended while it is charging.

⚠ WARNING! To prevent serious injury to people or property damage; do not charge a battery higher than its maximum rated charge. Over-charging a battery can cause it to explode; spraying the area with corrosive acid.

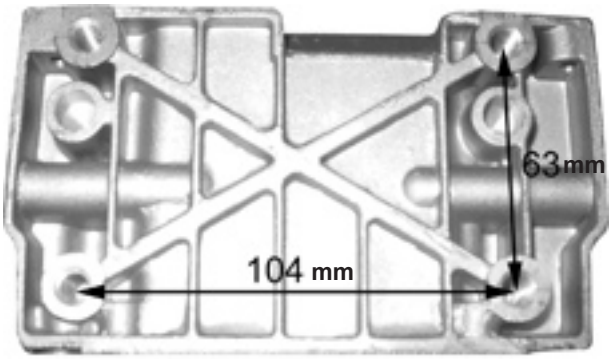
9. The Generator has a DC Circuit Protector (59a) to protect the unit in case of an overload. If an overload occurs, the Breaker will switch to its "OFF" position and cause the Generator to shut down. Press the DC Circuit Protector button (59a) to reset the Generator.

10. After the battery has been charged, disconnect the plug from the charging outlet first, then disconnect the clamps from the battery. Turn the Power Switch and the Fuel Valves to the "OFF" positions.

TECHNICAL SPECIFICATIONS

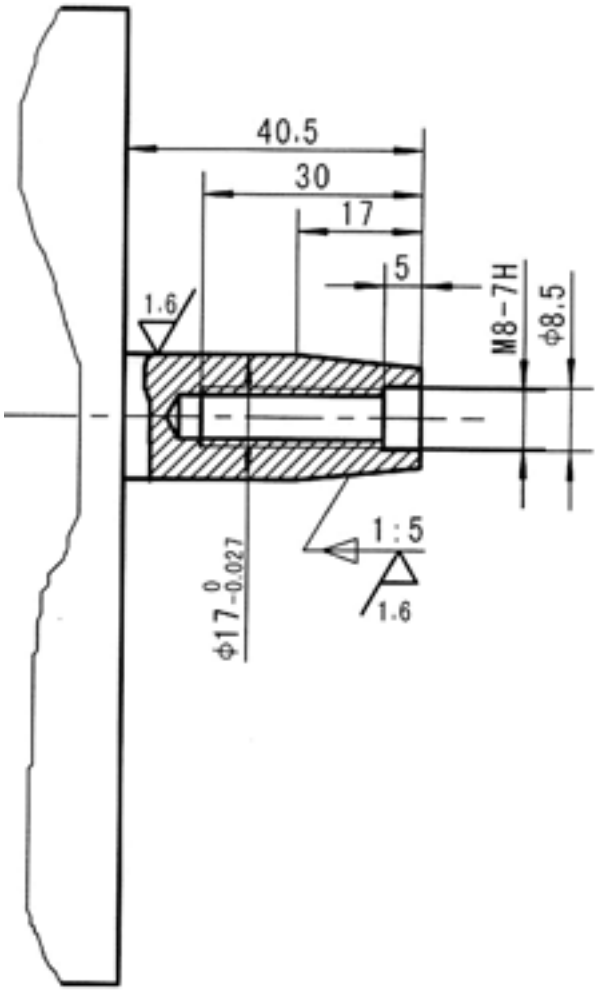
Engine Type		4 Stroke OHV
Bore x Stroke		52 x 38 mm
Compression Ratio		7.8:1
Displacement		79cc
Rotation viewed from PTO (power takeoff - the output shaft)		Counterclockwise
Fuel	Type	89+ octane unleaded gasoline
	Capacity	1.05 Gallons
Engine Oil	Type	SAE 10W30 (above 32° F) SAE 5W30 (at 32° F or below)
	Capacity	0.42 Quarts
Spark Plug	Type	E6TC DENSO-W2OFP-U
	Gap	0.6 - 0.7mm
Valve Clearance	Intake	0.15mm
	Exhaust	0.2mm
Speed	Maximum	3,600 RPM

MOUNTING HOLE PATTERN



M8 size thread hole, 4/5” depth

SHAFT SIZE/TYPE



SERVICING

⚠WARNING **TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING:**

Turn the Power Switch of the equipment to its “OFF” position, wait for the engine to cool, and disconnect the spark plug wire(s) before performing any inspection, maintenance, or cleaning procedures.

⚠WARNING **TO PREVENT SERIOUS INJURY FROM EQUIPMENT FAILURE: Do not use damaged equipment. If abnormal noise, vibration, or excess smoking occurs, have the problem corrected before further use.**

Maintenance Procedures

Many maintenance procedures, including those not detailed in this manual, will need to be performed by a qualified technician for safety. If you have any doubts about your ability to safely service the equipment or engine, have a qualified technician service the equipment instead.

Note: Warranty is void if proper maintenance and servicing procedures are not followed.

Engine Oil Change

⚠CAUTION! Oil is very hot during operation and can cause burns. Wait for engine to cool before changing oil.

1. Place a drain pan (not included) underneath the crankcase's drain plug.
2. Remove the drain plug and, if possible, tilt the crankcase slightly to help drain the oil out. Recycle used oil.
3. Replace the drain plug (and gasket, if supplied) and tighten it.
4. Refill the oil to the proper level following the instructions under the Starting the Engine section.

Air Filter Element Maintenance

1. Wipe off the air cleaner cover.
2. The air cleaner cover is held in place by a wing nut or clamps. Remove it.
3. Remove the air filter element.
4. **Cleaning:**

   For "paper" filter elements:
   To prevent injury from dust and debris, wear ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and heavy-duty work gloves. In a well-ventilated area away from bystanders, use pressurized air to blow dust out of the air filter from the side opposite the filter's normal air flow (the "clean" side of the filter).
   If this does not get the filter reasonably clean, replace it.

   a. For foam filter elements:
   Wash the element in warm water and mild detergent several times. Rinse. Squeeze out excess water and allow it to dry completely. Soak the filter in lightweight oil briefly, then squeeze out the excess oil.

5. Install the new filter or the cleaned filter. Secure the Air Cleaner Cover before use.

Spark Plug Maintenance

1. Disconnect spark plug wire from end of plug. Clean out debris from around spark plug.
2. Using a spark plug wrench, remove the spark plug.
3. Inspect the spark plug:
   If the electrode is oily, clean it using a clean, dry rag.

If the electrode has deposits on it, polish it using emery paper.
If the white insulator is cracked or chipped, the spark plug needs to be replaced.

4. When installing a new spark plug, adjust the plug's gap to the specification on the Technical specification chart. Do not pry against the electrode or the insulator, the spark plug can be damaged.

5. Install the new spark plug or the cleaned spark plug into the engine. Gasket-style: Finger-tighten until the gasket contacts the cylinder head, then about 1/2-2/3 turn more. Non-gasket-style: Finger-tighten until the plug contacts the head, then about 1/16 turn more.

6. Apply dielectric spark plug boot protector (not included) to the end of the spark plug and reattach the wire securely.

Fuel Filter Replacement (if equipped)

⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Replace the fuel filter in a well-ventilated area away from ignition sources. Do not smoke.

1. Wait for engine to cool completely before proceeding.

2. Wear protective gear including, ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and nitrile gloves.

3. Close fuel valve leading from gas tank completely.

4. Take note of the fuel filter's orientation.

5. Place a suitable container under the fuel filter.

6. Disconnect the fuel lines leading to and from the fuel filter and allow fuel to drain onto the container.

7. Install new fuel filter in the same orientation. Make sure to properly secure both fuel lines.

8. Clean up and properly dispose of all fuel.

9. Wait for at least one hour before use to allow all residual fuel vapors to dissipate. **To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.** Remember to open the fuel valve before restarting the engine. It may take a little longer than usual to start the engine because the fuel needs to refill the fuel line and new filter.

Cleaning, Maintenance, and Lubrication Schedule

Note: This maintenance schedule is intended solely as a general guide. If performance decreases or if equipment operates unusually, check systems immediately. The maintenance needs of each piece of equipment will differ depending on factors such as duty cycle, temperature, air quality, fuel quality, and other factors.

Note: These procedures are in addition to the regular checks and maintenance explained as part of the regular operation of the engine and equipment.

After Initial 20 Operation Hour Period:

a. Change engine oil.

Every 25 Operation Hours Thereafter:

a. Clean/replace air filter element.

b. Inspect/clean spark plug.

Every 50 Operation Hours:

a. Change engine oil.

b. Replace fuel filter (if equipped).

Every 100 Operation Hours:

a. Replace spark plug.

b. Replace air filter element.

Note: All maintenance procedures scheduled for 25, 50, and 100 operation hours should be performed at least yearly.

Every 300 Operation Hours:

a. Clean fuel tank and carburetor.

b. Clean carbon build-up from combustion chamber.

Storage

1. Wait for engine to cool, then clean engine with clean cloth.
2. When the equipment is to remain idle for longer than 20 days, prepare the engine for storage as follows:
   a. Change engine oil and empty fuel tank.
   b. Either leave fuel tank empty or refill fuel tank with fresh unleaded gasoline mixed with a fuel stabilizer intended for long term engine storage (not included). After filling, run engine for about 5-10 minutes to circulate the treated gasoline through the carburetor. Wait for engine to cool before proceeding.
   c. Clean out area around spark plug. Remove spark plug and pour one tablespoon of engine oil into cylinder through spark plug hole.
   d. Reinstall spark plug, but leave spark plug wire disconnected.
   e. Pull recoil starter to distribute oil in cylinder. Stop after one or two revolutions when you feel the piston start the compression stroke (when you start to feel resistance).
   f. Disconnect battery cables.
3. Apply a thin coat of rust preventive oil to all uncoated metal parts.
4. Cover and store in a dry, well-ventilated area out of reach of children.
5. Before starting the engine after storage, keep in mind that untreated gasoline will deteriorate quickly. Drain the fuel tank and filter, and change to fresh fuel if untreated gasoline has been sitting for a month, if treated gasoline has been sitting beyond the fuel stabilizer's recommended time period, or if the engine does not start properly.

Troubleshooting

Problem	Possible Causes	Probable Solutions
Engine will not start	FUEL RELATED:	FUEL RELATED:
	1. No fuel in tank or fuel valve closed.	1. Fill fuel tank and open fuel valve.
	2. Choke not in start position, especially with cold engine.	2. Move choke to start position if engine is cold.
	3. Low quality or deteriorated, old gasoline.	3. Use only fresh 89+ octane unleaded gasoline.
	4. Carburetor not primed.	4. Prime carburetor by pressing priming bulb specified number of times (if equipped).
	5. Dirty fuel passageways blocking fuel flow.	5. Clean out passageways using fuel additive. Heavy deposits may require further cleaning.
	6. Carburetor needle stuck. Fuel can be smelled in the air.	6. **Gently** tap side of carburetor float chamber with screwdriver handle.
	7. Too much fuel in chamber. This can be caused by the carburetor needle sticking.	7. Turn choke to run position. Remove spark plug and pull the start handle several times to air out the chamber. Reinstall spark plug and set choke to start position.
	8. Clogged fuel filter	8. Clean or replace fuel filter
	IGNITION (SPARK) RELATED:	IGNITION (SPARK) RELATED:
	1. Spark plug wire not connected securely.	1. Connect spark plug wire properly.
	2. Spark plug electrode wet or dirty.	2. Clean spark plug.
	3. Incorrect spark plug gap.	3. Correct spark plug gap.
	4. Spark plug wire or spark plug broken.	4. Replace spark plug wire and/or spark plug.
	5. Incorrect spark timing or faulty ignition system.	5. Have qualified technician diagnose/ repair ignition system.
	COMPRESSION RELATED:	COMPRESSION RELATED:
	1. Cylinder not lubricated. Problem after long storage periods.	1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again.
	2. Loose or broken spark plug. (Hissing noise will occur when trying to start.)	2. Tighten spark plug. If that does not work, replace spark plug. If problem persists, may have head gasket problem, see #3.
	3. Loose cylinder head or damaged head gasket. (Hissing noise will occur when trying to start.)	3. Tighten head. If that does not remedy problem, replace head gasket.
	4. Engine valves or tappets misadjusted or stuck.	4. Adjust valve clearance. If that does not work, clean or replace valves/ tappets.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Troubleshooting

Problem	Possible Causes	Probable Solutions
Engine misfires	1. Spark plug wire loose.	1. Check wire connections.
	2. Incorrect spark plug gap or damaged spark plug.	2. Re-gap or replace spark plug.
	3. Defective spark plug wire.	3. Replace spark plug wire.
	4. Old or low quality gasoline.	4. Use only fresh 89+ octane unleaded gasoline.
	5. Incorrect compression.	5. Diagnose and repair compression. (Use **Engine will not start: COMPRESSION RELATED** section.)
Engine stops suddenly	1. Low oil shutdown.	1. Fill engine oil to proper level. Check engine oil before EVERY use.
	2. Fuel tank empty or full of impure or low quality gasoline.	2. Fill fuel tank with fresh 89+ octane unleaded gasoline.
	3. Defective fuel tank cap creating vacuum, preventing proper fuel flow.	3. Test/replace fuel tank cap.
	4. Improper idle speed.	4. Properly adjust idle speed.
	5. Faulty magneto, incorrect timing, or clogged carburetor.	5. Have qualified technician diagnose and service engine.
Engine knocks	1. Old or low quality gasoline.	1. Fill fuel tank with fresh 89+ octane unleaded gasoline.
	2. Engine overloaded.	2. Do not exceed equipment's load rating.
	3. Incorrect spark timing, deposit buildup, worn engine, or other mechanical problems.	3. Have qualified technician diagnose and service engine.
Engine backfires	1. Impure or low quality gasoline.	1. Fill fuel tank with fresh 89+ octane unleaded gasoline.
	2. Engine too cold.	2. Use cold weather fuel and oil additives to prevent backfiring.
	3. Choke not open after engine warm.	3. Move choke to run position after engine warms up.
	4. Engine not properly adjusted for high altitude operation.	4. Qualified technician must adjust engine at altitudes greater than 5,000 feet above sea level.
	5. Intake valve stuck, choke stuck, incorrect timing, clogged carburetor, or overheated engine.	5. Have qualified technician diagnose and service engine.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

GENERATOR PARTS LIST

Part	Description	Qty
1a	Battery Charging Cord (not shown)	1
2a	Fuel Tank Cap	1
3a	Fuel Tank Filter	1
4a	Flange Bolt M6x20	4
5a	Gasket	4
6a	Screw Gasket	4
7a	Anti-Vibration Gasket	4
8a	Fuel Tank	1
9a	Fuel Valve	1
10a	Fuel Pipe Clamp	2
11a	Oil Pipe	1
12a	Engine	1
13a	Exhaust Pipe Gasket	1
14a	Exhaust Pipe	1
15a	Lock Nut M8	2
16a	Flange Bolt M6x12	2
17a	Muffler Gasket	1
18a	Muffler	1
19a	Flange Bolt M6x12	1
20a	Front Cover	1
21a	Gasket	4
22a	Flange Bolt M8x20	4
23a	Rotor Assembly	1
24a	Stator Assembly	1
25a	Wiring Cover	1
26a	Rear Cover	1
27a	Rectifier	1
28a	Gasket	4
29a	Spring Gasket	4

GENERATOR PARTS LIST

Part	Description	Qty
30a	Bolt	4
31a	Gasket	1
32a	Spring Gasket	1
33a	Bolt M8x170	1
34a	Magneto Cover	1
35a	Gasket	2
36a	Spring Gasket	2
37a	Bolt M5x8	2
38a	Lock Nut M8	6
39a	Gasket	8
40a	Spring Gasket	8
41a	Bolt M8x40	8
42a	Cushion	2
43a	Frame	1
44a	Anti-Vibration Feet	4
45a	Flex Tube	1
46a	Circuit Cover	1
47a	Bolt M4x10	2
48a	Capacitor	1
49a	Bolt M4x10	1
50a	Panel	1
51a	Bolt M6x25	4
52a	Power Switch	1
53a	AC Circuit Protector	1
54a	AC Outlet	2
55a	Grounding Point	1
57a	Battery Charging Socket	1
59a	DC Circuit Protector	1
60a	Rubber Gasket	1
61a	Bracket for Capacitor	1

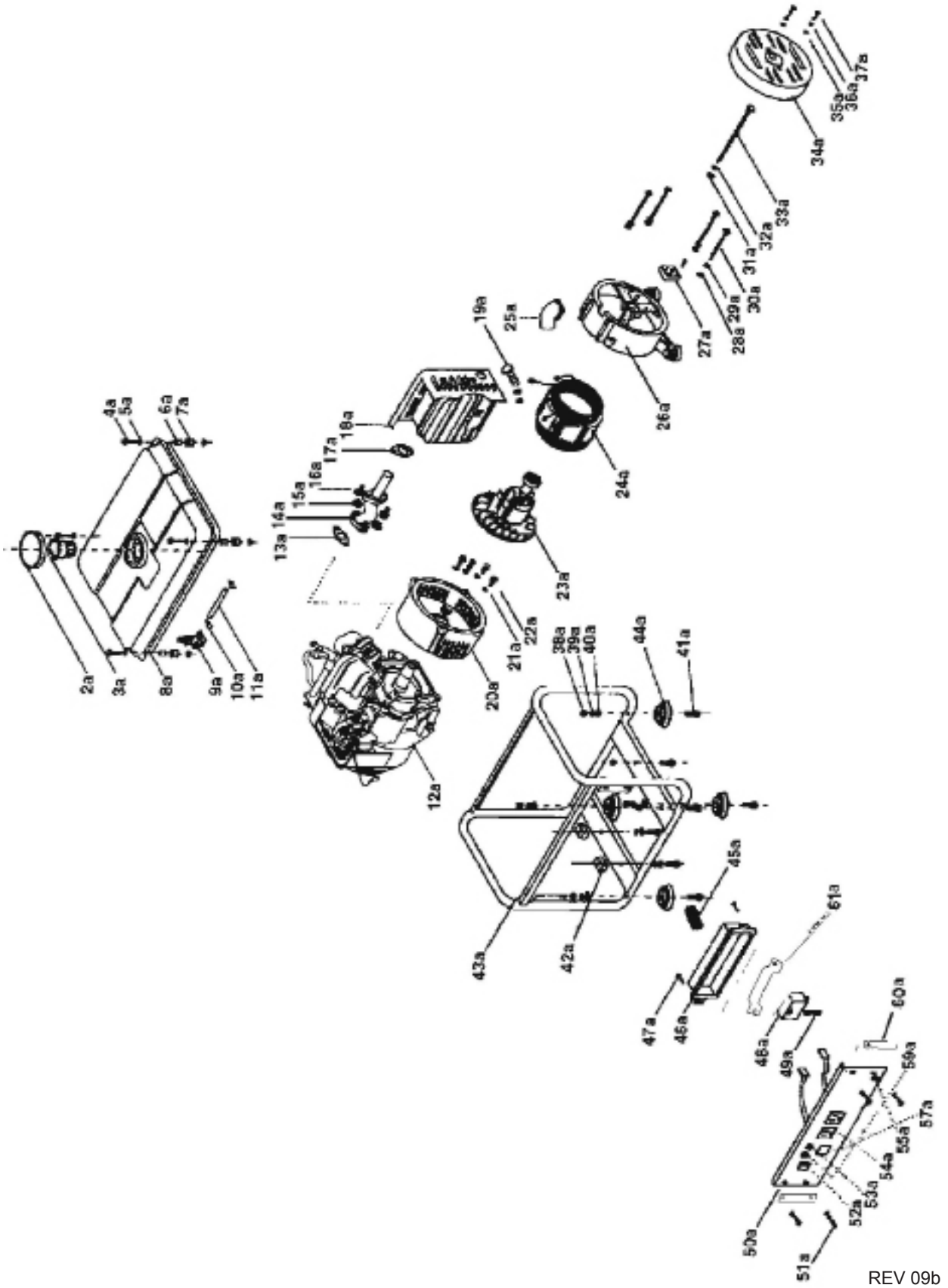
Record Product's Serial Number Here:_____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts in both parts lists are listed and shown for illustration purposes only, and are not available individually as replacement parts.

REV 09b

ASSEMBLY DIAGRAM



REV 09b

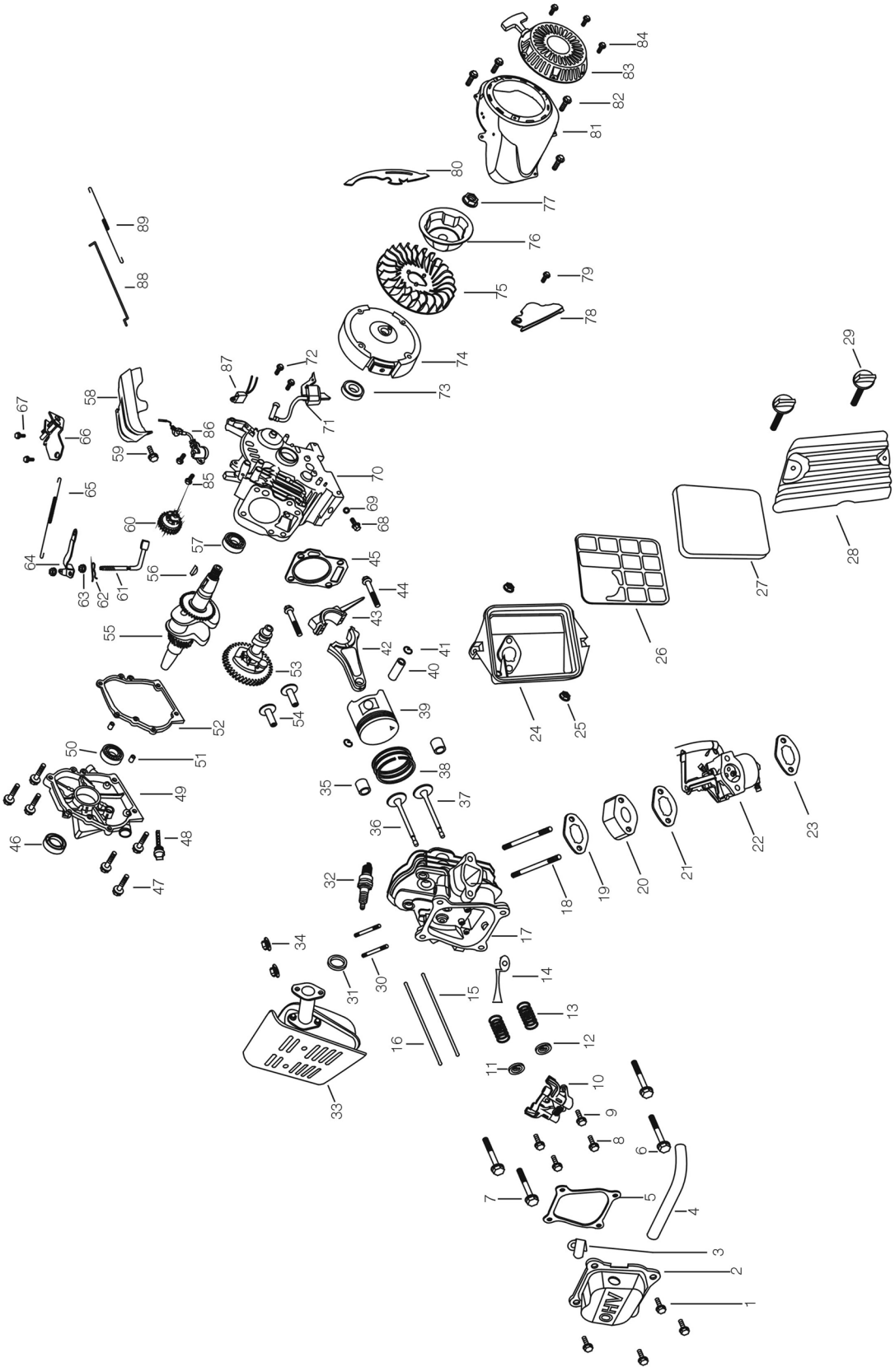
ENGINE PARTS LIST

Part	Description	Qty
1	Flange Bolt M6x12	4
2	Head Cover	1
3	Apron Plate	1
4	Breather Tube	1
5	Head Cover Packing	1
6	Flange Bolt M8x55	2
7	Flange Bolt M8x55	2
8	Flange Bolt M6x16	2
9	Flange Bolt M6x16	2
10	Rocker Assembly	1
11	Exhaust Valve Spring Retainer	1
12	Intake Valve Spring Retainer	1
13	Valve Spring	2
14	Apron Plate	1
15	Push Rod	1
16	Push Rod	1
17	Cylinder Head	1
18	Carburetor Stud Bolt	2
19	Intake Pipe Gasket	1
20	Carburetor Insulating Plate	1
21	Carburetor Gasket	1
22	Carburetor	1
23	Carburetor Spacer	1
24	Air Filter Housing	1
25	Flange Nut M6	2
26	Apron Plate	1
27	Air Filter	1
28	Air Filter Cover	1
29	Air Filter Cover Bolts	2
30	Exhaust Pipe Stud Bolt	2
31	Muffler Gasket	1
32	Spark Plug	1
33	Muffler	1
34	Flange Nut M8	2
35	8x14 Dowel Pin	1
36	Exhaust Valve	1
37	Intake Valve	1
38	Piston Ring Set	1
39	Piston	1
40	Piston Pin	1
41	Piston Pin Clip 18mm	2
42	Connecting Rod Assembly	1
43	Connecting Rod Assembly	1
44	Connecting Rod Assembly	2
45	Cylinder Head Gasket	1
46	Oil Seal	1
47	Flange Bolt M8x25	6
48	Dipstick	1
49	Crankcase Cover	1
50	Ball Bearing 6303	1
51	8x14 Dowel Pin	2
52	Case Cover Packing	1
53	Camshaft	1

ENGINE PARTS LIST

Part	Description	Qty
54	Valve Lifter	2
55	Crankshaft	1
56	Key	1
57	Ball Bearing 6203	1
58	Shroud	1
59	Flange Bolt M6x12	1
60	Governor Gear	1
61	Rocker	1
62	8mm Lock Pin	1
63	Flange Bolt M6	2
64	Control Arm	1
65	Governor Spring	1
66	Control Assembly	2
67	Flange Bolt M6x8	2
68	Drain Bolt Plug	1
69	Drain Plug Washer	1
70	Crank Case	1
71	Ignition Coil	1
72	Flange Bolt M6x20	2
73	Crankcase Cover	1
74	Flywheel	1
75	Cooling Fan	1
76	Starter Pulley	1
77	Flywheel Nut M14x1.25	1
78	Flywheel Side Plate	1
79	Flange Bolt M6x12	4
80	Flywheel Side Plate	1
81	Fan Cover	1
82	Flange Bolt M6x12	4
83	Recoil Starter	1
84	Flange Bolt M6x10	3
85	Flange Bolt M6x12	2
86	Oil Level Switch	1
87	Amplifier	1
88	Governor Rod	1
89	Throttle Return Spring	1

ENGINE DIAGRAM



LIMITED 1 YEAR / 90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that for a period of ninety days from date of purchase that the engine/motor, the belts (if so equipped), and the blades (if so equipped) are free of defects in materials and workmanship. Harbor Freight Tools also warrants to the original purchaser, for a period of one year from date of purchase, that all other parts and components of the product are free from defects in materials and workmanship (90 days if used by a professional contractor or if used as rental equipment). This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

3491 Mission Oaks Blvd. • PO Box 6009 • Camarillo, CA 93011 • (800) 444-3353

EMISSION CONTROL SYSTEM WARRANTY

California and United States Emission Control Defects Warranty Statement

The California Air Resources Board (herein CARB), the United States Environmental Protection Agency (herein EPA), and Harbor Freight Tools (herein HFT) are pleased to explain the emission control system warranty on your 1995 and later Small Off-Road Engine (herein engine). In California, the engine must be designed, built and equipped to meet the State's stringent anti-smog standards. Elsewhere within the United States, new off-road, spark-ignition engines certified for model year 1997 and later, must meet similar standards set forth by the EPA. HFT must warrant the emission control system on your engine for the periods of time described below, provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the carburetor or fuel-injection system, and the ignition system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, HFT will repair your engine at no cost to you including diagnosis, parts and labor.

Manufacturer's Warranty Coverage

The 1995 and later engines are warranted for two (2) years. If any emission-related part on your engine is defective, the part will be repaired or replaced by HFT.

Harbor Freight Tools Emission Control Defects Warranty Coverage

Engines are warranted for a period of two (2) years relative to emission control parts defects, subject to the provisions set forth below. If any emission related part on your engine is defective, the part will be repaired or replaced by HFT.

Owner's Warranty Responsibilities

- As the engine owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. HFT recommends that you retain all receipts covering maintenance on your engine, but HFT cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the engine owner, you should, however, be aware that HFT may deny you warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.
- You are responsible for shipping your engine to a HFT warranty station as soon as a problem exists. Contact the HFT Customer Service department at the number below to make shipping arrangements. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact the Harbor Freight Tools Customer Service Department at 1-800-444-3353.

Harbor Freight Tools Emission Control Defects Warranty Provisions

1. Length of Coverage

HFT warrants to a first retail purchaser and each subsequent purchaser that the engine is free from defects in materials and workmanship that cause the failure of warranted parts for a period of two (2) years after the date of delivery to the first retail purchaser.

2. No Charge Repair or Replacement

Repair or replacement of any warranted part will be performed at no charge to the owner if the work is performed through a warranty station authorized by HFT. For emissions warranty service, contact the HFT Customer Service Department at 1-800-444-3353.

3. Consequential Damages Coverage

Coverage under this warranty shall also extend to the failure of any engine components caused by the failure of any warranted part while it is still covered under this warranty.

4. Coverage Exclusions

Warranty claims shall be filed in accordance with the provisions of the HFT warranty policy explained in the box at the top of the previous page. HFT shall not be liable for any loss of use of the engine, for any alternative usage, for any damage to goods, loss of time, or inconvenience. Warranty coverage shall also be excluded for any part which fails, malfunctions, or is damaged due to failure to follow the maintenance and operating instructions set forth in the Owner's Manual including, but not limited to:

a) Use of parts which are not authorized by HFT

b) Improper installation, adjustment or repair of the engine or of any warranted part unless performed by an authorized warranty center

c) Failure to follow recommendations on fuel use contained in the Owner's Manual

d) Improper or inadequate maintenance of any warranted parts

e) Repairs performed outside of the authorized warranty service dealers

f) Alterations by changing, adding to or removing parts from the engine.

5. Service and Maintenance

Component parts which are not scheduled for replacement as required maintenance or are scheduled only for regular inspection to the effect of "repair or replace as necessary" are warranted for the warranty period. Any warranted part which is scheduled for replacement as required maintenance is warranted for the period of time up to the first scheduled replacement point for that part. Any replacement part, provided it is equivalent in durability and performance, may be used in performance of maintenance or repairs. The owner is responsible for commissioning a qualified technician/mechanic to perform all required maintenance, as outlined in the Inspection, Cleaning, and Maintenance section in this manual.

6. Warranted Parts

1) Fuel Metering System
   - i) Carburetor and its internal parts.
   - ii) Fuel pump (if so equipped).
   - iii) Cold start enrichment system.
2) Air Induction System
   - i) Intake pipe/manifold.
   - ii) Air cleaner.
3) Ignition System
   - i) Spark plug.
   - ii) Magneto ignition system.
4) Catalyst System (if so equipped)
   - i) Exhaust pipe stud.
   - ii) Muffler.
   - iii) Catalytic converter (if so equipped).
5) Miscellaneous Items Used in Above Systems
   - i) Vacuum, temperature and time sensitive valves and switches.
   - ii) Hoses, belts, connectors, and assemblies.